DEVELOPMENT AND EVALUATION OF THE STANDARD ADENOTONSILLECTOMY CLINICAL PATHWAY IN HOSPITAL UNIVERSITI SAINS MALAYSIA

BY

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ABSTRAK

Tajuk:

Penilaian piawaian klinikal pembedahan tonsil dan adenoid di Hospital Universiti Sains Malaysia

Pendahuluan

Variasi penjagaan pesakit merupakan sumber yang amat dititik beratkan dalam penyampaian penjagaan kesihatan. Punca variasi adalah kepelbagaian dalam perkhidmatan penjagaan kesihatan, kekurangan penggunaan bahan-bahan bukti dan kewujudan profesional yang tidak menentu. Untuk mengurangkan perbezaan ini banyak panduan dan cara-cara penilaian telah dicipta daripada amalan perubatan berasaskan bukti; salah satu caranya ialah clinical pathway (CP), pelan penjagaan pelbagai disiplin yang memperincikan langkah-langkah awal penjagaan pesakit dengan masalah klinikal tertentu yang disokong dan berpandukan klinikal protokol tempatan.

Hospital Universiti Sains Malaysia (HUSM) telah melaksanakan CP pada 2012 dan kini sedang menjalankan kajian dalam pelaksanaan CP yang melibatkan sebelas kepakaran, dan pembedahan tonsil dan adenoid telah dipilih di bawah ORL-HNS.

Objektif:

Untuk menilai piawaian CP dalam merawat pesakit pembedahan tonsil dan adenoid di Hospital USM

Metodologi

Ini adalah satu kajian perbandingan longitudinal dijalankan dalam tempoh lapan belas bulan di HUSM dari Mac 2014 hingga September 2015. Kelulusan Jawatankuasa etika penyelidikan Universiti (bahagian kemanusiaan) telah diperolehi. Maklumat yang

digunakan dalam kajian ini diiambil dari Unit Rekod Perubatan (HUSM). Nota pesakit yang memenuhi kriteria pemilihan kajian telah dipilih dan disemak secara individu bagi CP dan non CP selama enam bulan. Data yang diperolehi disimpan dalam perisian, dibanding dan dianalisa.

Keputusan:

Seramai 60 pesakit telah terpilih dalam kajian ini, 30 untuk setiap kumpulan; CP dan non CP. 18 perempuan dan 12 lelaki telah dipilih dalam Kumpulan CP dan 16 perempuan dan 14 lelaki telah dipilih dalam Kumpulan non CP. Purata umur peserta adalah 13.9 dan 17.1 tahun untuk CP dan non CP. Anggaran tempoh kemasukan yang diperhatikan dalam kajian ini ialah 0.9833 dan 1.05 untuk non CP dan CP. Hasilnya tidak menunjukkan sebarang manfaat signifikandi kedua- dua kumpulan (Z =-.853; p =. 393 >.05). Dua dan enam komplikasi selepas pembedahan diperhatikan dalam non CP dan CP, Z =-1.506, (nilai P = 0.132 > 0.05). Tiada perbezaan yang ketara dari segi kadar komplikasi di kedua-dua kumpulan. Secara purata dianggarkan kos pembedahan tonsil dan adenoid untuk kumpulan CP dan non CP ialahRM 3010dan RM 3000, masing-masing dan nilai adalah jauh lebih rendah berbanding RM4725 yang disebut dalam sistem MY-DRG casemix. Pematuhan CP secara keseluruhannya mencecah 88.4% dalam kajian dan ianya sangat tinggi. Lebih 90% pesakit yang mematuhi CP, diikuti oleh jururawat dengan 89.9% manakala doktor dengan 87.5%. Terdapat lapan perbezaan yang diperhatikan dalam kajian ini, enam daripadanya adalah dari pengamal perubatan yang meliputi 75%, manakala dua perbezaan lagi adalah daripada pesakit yang mencakupi 25%.

Kesimpulan

Kajian ini telah menilai laluan klinikal taraf adenotonsillectomy dengan melihat ke ′dalam hasil khusus parameter tertentu seperti tempoh penginapan hospital, varians, komplikasi operasi pos, proses pengiraan kos dan keberkesanan kajian secara keseluruhan .

Peserta `baseline data′ demografi hampir sama antra kedua-dua kumpulan kajian, tidak ada perbezaan yang signifikan dari segi tempoh penginapan hospital, kos dan komplikasi antra kedua-dua kumpulan.

Lapan perbezaan yang diperhatikan dalam kajian ini iaita mempunyai sumber mereka daripada pesakit dan enam daripada penyedia penjagaan kesihatan. Pematuhan keseluruhan laluan ini sangat baik.

Kami tidak dapat untuk mendapatkan penjimatan kos kerana tidak ada perbezaan kos yang ketara antra kedua-dua kumpulan kajian.

ABSTRACT

Title: Development and Evaluation the Standard Adenotonsillectomy Clinical Pathway in Hospital Universiti Sains Malaysia

Introduction

Patient care variation is an important source of concern in health care delivery. It main sources are in the area of availability of health care services, lower use of medical evidence, and the professional uncertainties. To reduce this variation many guidelines and evaluating tools were created from evidence base medicine practice; one of this tool is clinical pathway (CP), a multidisciplinary structure care plan that detailed essential steps in the care of a patient with specific clinical problems, it supports and translates clinical guides to the local protocol.

Hospital Universiti Sains (Hospital USM) had implemented clinical pathway in 2012 and currently conducting a survey on the CP implementation involving eleven specialities, adenotonsillectomy was selected under ORL-HNS.

Objectives:

To evaluate the standard Clinical Pathway of adenotonsillectomy patients in Hospital USM.

Methodology:

This was a cross-sectional comparative study conducted over a period of eighteen months in Hospital USM from March 2014 to September 2015.

The Universiti Research Ethics Committee (Human) approval has been obtained. Information used in this study was retrieved from implemented CP patient information form and from (Hospital USM) Medical Record Unit. Case note of patients who fulfil inclusion criteria were selected in nonrandomized pattern and reviewed individually for both clinical pathway (CP) and non-clinical pathway (non CP) groups over a period of six months. The data obtained was stored in software, compared and analyses.

Results:

Total of 60 patients were involved in this study 30 in each CP and non CP groups. 18 females, 12 males were involved in CP group and 16 females and 14 males were involved in non CP group. The average age of participant was13.9 years and 17.1 years in CP and non CP groups respectively. The estimated length of stay observed in this study were 0.9833 and 1.05 for non CP and CP group respectively. The result did not show any statistically observed difference between the groups (Z=-.853; p=.393>.05).

Two and six post-operative complications were observed in both non CP and CP groups respectively, Z= -1.506, (P value =0.132 >0.05).There was no significant difference in terms of complications rate between non CP and CP groups.

An average estimated adenotonsillectomy cost for CP and non CP group were RM3000 and RM3010 respectively this value was lower than RM4725 quoted in MY-DRG casemix system.

An overall 88.4% compliance rate to CP guideline was observed in CP group. Patient complied more with 90%, followed by nurses with 89.9% then doctors with 87.5%.

There were eight observed CP variances in this study, six out of this have their sources from a health care provider's and accounts for75%, two variances were from patients and accounts for 25%.

Conclusion

This study has evaluated the standard clinical pathway of adenotonsillectomy by looking into specific outcomes of certain parameters such as length of hospital stay, variances, post-operation complications, costing process and overall study effectiveness.

The baseline participant demographic data were almost equal between two study groups, there was no significant difference in terms of duration of hospital stay, costing and complications between the two groups.

Eight variances were observed in this study, two have their sources from the patients and six from health care providers. The overall compliance of pathway has been very good.

We were unable to obtain a cost saving because there was no significant cost difference between the two study groups.

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CP	Clinical pathway
non CP	none clinical pathway group
HOSPITAL USM	Hospital Universiti Sains Malaysia
MY-DRG	Malaysian diagnostic related group

CHAPTER ONE

INTRODUCTION

Health policy makers and monitory regulatory body's want health care providers to deliver qualitative and efficacious services to their patients or clients with given resources. To comply with above directs health care providers were compelled to review and overhaul clinical management, making it more client-friendly with better financial gain. Many strategies have been designed by health care providers; Casemix, clinical pathway (CP) to mention a few all were directed toward delivering sound health care services at minimum cost to patients or client.

Casemix is a tool of classification patient's treatment episodes, it is designed to create classes that are relatively homogenous irrespective of the resources used and that contain patients with similar clinical characteristic (Palmer & Reid., 2001). Hospital Universiti Sains Malaysia (Hospital USM) has implemented a Casemix System in 2014. With the aim of improving efficiency and quality of health care provided to patients by simplifying the process of diagnosis and classification of patient medical conditions using highly innovative software (Mohamad, 2012).

The Malaysian Casemix System (MY-DRG) took into account of 13 variables which are: as follows:

1. Identifier (Name, RN, AN, Race, Ward, Disciplines)
2. Age
3. Gender

4. Date of Birth
5. Birth Weight (for Neonate < 7 days of age)
6. Date of Admission
7. Date of Discharge
8. Length of Stay
9. Discharge Disposition
10. Principle Diagnosis
11. Secondary Diagnoses (Co-morbidities, Complications)
12. Principle Procedure /Operation
13. Secondary Procedures /Operation

Casemix system covered patient's demography, principle diagnosis, and co-morbidities. It has similarity with CP because both considered cases as homogenous irrespective of the resources used.

A clinical pathway is a method of patient-care management in well-defined group at a well-defined period of time. It explicitly states the goals and key elements of care on Evidence Based- Medicine (EBM) guidelines, best practice and patient expectations by facilitating the communication, coordinating roles and sequencing the activities of the multidisciplinary care team, patients and their relatives; by documenting, monitoring and evaluating variances; and by providing the necessary resources and outcomes. (De Bleser et al., 2006).

The general aim of a CP is to improve the quality of care provision to patients, increase patient satisfaction and increase the efficiency in the resources use. (McCallin & Antoinette, 2011). CP involved multidisciplinary team and has focused on the quality and care co-ordination. (Hunter & Segrott, 2008). CP is different from clinical guideline which is defined; as consensus statements that are systematically developed to assist professionals in making patient management decision related to specific circumstances. (Graham& Harrison, 2005).

CP is also different from Protocol which was considered as treatment recommendation that are based on guidelines which may or not involved continuous monitoring of data and it is evaluation component. (Hope, 2005).

Patients care variations are an important source of concern in health care delivery. It main sources is in the area of availabilities of health care services, lower use of medical evidence, and the professional uncertainties. (Mayberry et. al., 2006). These sources of health care variations were observed in both developed and developing countries. (Peabody et al., 2006). In search of solution many countries adopted CP as a standard tool for achieving sound health care services delivery (Grol. 2001).

CP has been developed and utilized in many countries because of it is inherent potential to minimize the variation and breach evidence to practice gap in patient management (Huckson & Davies., 2007).

Clinical pathway studies were conducted in Asia countries with a mixed result (Cheah, 2000). In Malaysia, Universiti Kebangsaan Malaysia Medical Centre (UKMMC) initiated the CP (flow of management). The result of studies on CP conducted at UKMMC indicated it supported the continuity and co-ordination of care across different clinical disciplines, reduced variances in patient care and standardized patient management (Aniza et al., 2008).

Hospital Universiti Sains (Hospital USM) has implemented clinical pathway in 2012 and currently is conducting a study on the implemented CP involving eleven specialties. The aims of the Hospital USM study was to assess the extent of utilization of standard CP, evaluate the impact of the standard CP in patient management, to identify the sources of patient care variation, to estimate the resources utilization. This dissertation is part of the Hospital USM CP implementation study, it aimed to developed and evaluate standardized clinical pathway of adenotonsillectomy in Hospital USM.

CHAPTER TWO

LITERATURE REVIEW

2.1 General overview

The decision in patient management has shifted from opinion-based on to a scientific evidence-based medicine (EBM). EBM is commonly defined as the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients (Sackett et al., 1996). EBM aims to addresses the persistent problem of clinical practice variation with the help of various tools, including standardized practice guidelines (Timmermans & Mauck, 2005).

Many guidelines and evaluating tools were created from evidence base medicine practice; one of this tool is clinical pathway which defined by Campbell: as a multidisciplinary structure care plan that detailed essential steps in the care of patient with specific clinical problems it supports and translates clinical guides to the local protocol (Campbell et al., 1998).

Clinical pathway may be viewed as a care plan that translates an evidence into local structures, it is main aims is to meet patients' expectations. (Kinsman. 2010). It has the following features:

Facilitator who will communicate with the health team and patients.

A multidisciplinary sequenced care team activities

It needs documentation, monitoring, and evaluation of variables and outcomes.

Cases suitable for clinical pathway must be common, high in volume, costly and have a predictable outcome (Tangcharoensathien et al., 2011).

The benefits of clinical pathway if implemented fully includes the followings: It minimizes inappropriate resource utilization, reduces the cost of treatment a n d duration of hospital stays (Walter et al., 2001).

It provides a framework for collecting and analyzing a data which health care providers may utilize to get more insight into variations of disease course (Cheah, 2000).

2.2 Adenotonsillectomy

2.2.1 Anatomy of adenoid and tonsils

Adenoid (pharyngeal tonsils), lingual tonsils and palatine tonsils are aggregate of lymphoid tissue collectively known as Waldeyer's ring. The palatine tonsils is the largest component of this ring, it is oval in shape and situated in tonsillar fossa which was bounded anteriorly by palatoglosus muscle, posteriorly by palatopharyngeus muscle, laterally it is covered by fibrous capsules next to it is a loose areola tissue that separates it from tonsillar bed as shown in (figure 2.1). Medially it is free and contains crypts on it is surface that deepened into it is tissue and covered by stratified squamous epithelium, these crypts increase tonsillar surface area and served as a reservoir of microorganism and source of reinfection. The tonsils contain two poles; an upper pole that extend to the soft palate and lower pole that reached base of tongue. The tonsil is enriched with blood supply mainly from tonsillar branch of facial artery with contribution from an ascending branch of the facial artery, ascending pharyngeal from the external carotid artery, dorsal lingual branch from lingual artery and descending palatine branch from internal maxillary artery. Its venous drainage is started from paratonsillar vein to common facial vein then to the pharyngeal venous plexus. Lymphatic drainage is to upper cervical group of lymph nodes, nerve supply from lesser palatine nerve (Licameli & Tunkel, 2013).

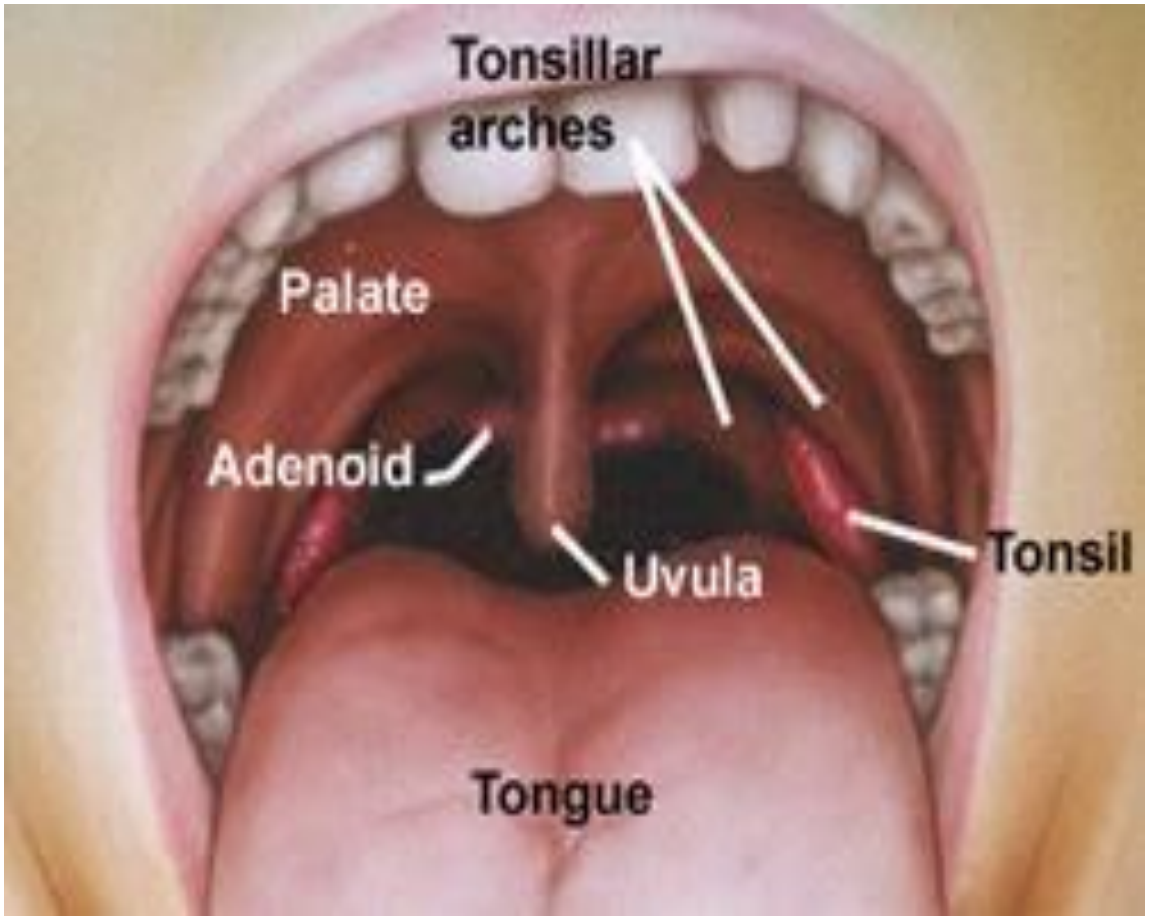

Figure 2.1: Anatomy of Adenotonsils

(Adopted from www.yoursurgery.com)

2.2.2 Adenotonsillitis

Tonsil is located at the gateway of the respiratory and gastrointestinal tract, because of its location it is predisposed to infection. Tonsils enlargement is known as tonsillar hypertrophy whereas the adenoid enlargement is known as adenoid hypertrophy. Tonsillar infection is known as tonsillitis while adenoid infection is adenoiditis as shown in (figure 2. 2). At times, tonsillitis is associated with adenoiditis. This can be a component of throat infection known as a sore throat which is comprised pharyngitis and tonsillitis. It is mainly bacterial or viral in origin. It is associated with pain, difficulty in swallowing (Nina, 2012).

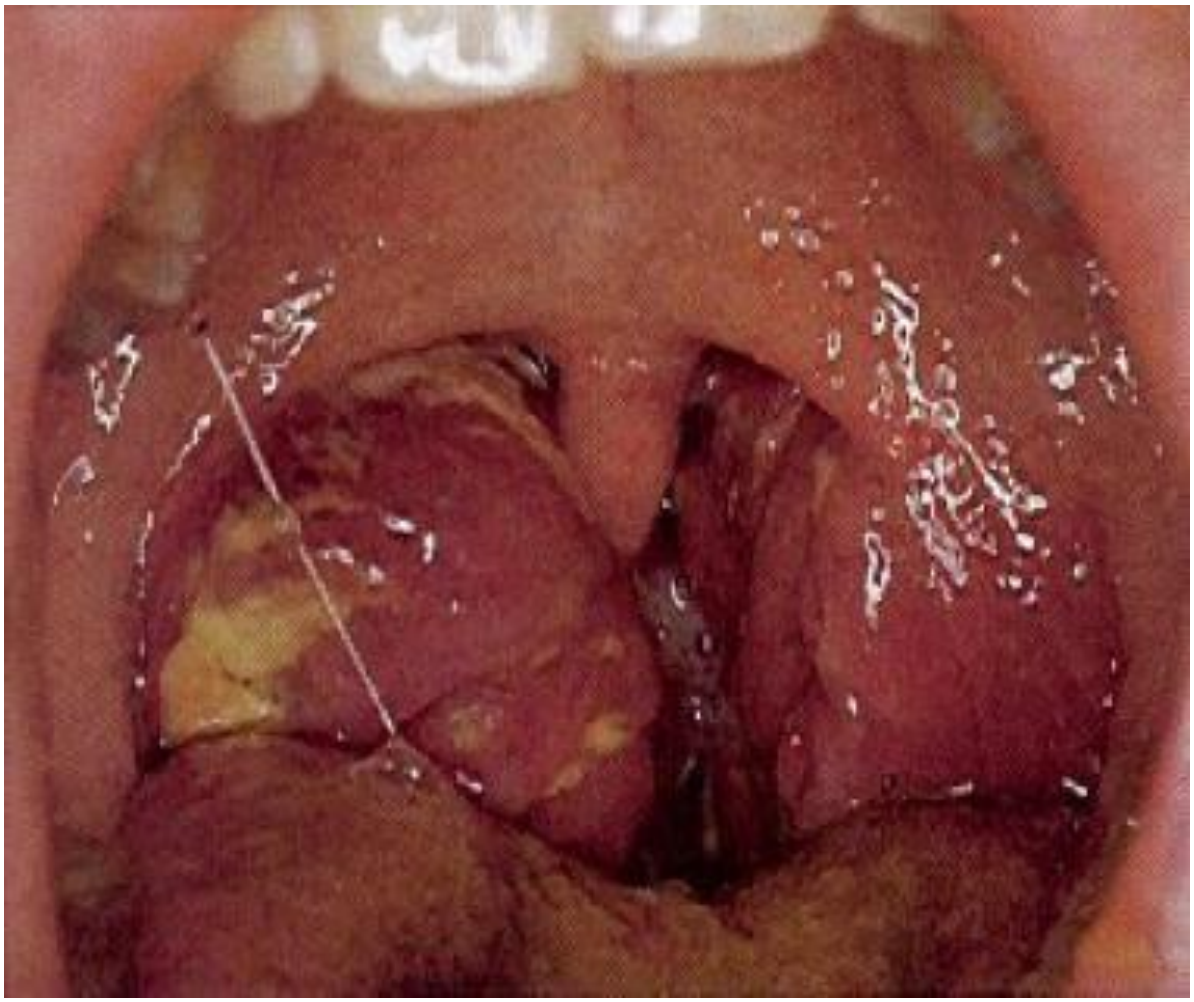

Figure 2.2: Infected tonsils

(Adapted from emedicinemedscape.com)

2.2.3 Management of adenotonsillitis

Management of adenotonsillitis like others medical conditions depends on the severity of the disease, in mild cases patients will be given supportive treatment, but if it becomes recurrent and interfering with patient life activity surgical treatment may become the best option. So many guidelines are available for management of adenotonsillar diseases but most famous is of American Academy of Otolaryngology-Head and Neck Surgery (AAO-HNS). This is based on Paradise Study in 2002, the summary of the criteria is shown in table 2.1.

Table 2.1: AAO-HNS 2011 practical guideline on tonsillectomy

Criterion	Definition
Minimum frequency of sore throat episodes	7 or more episodes in the preceding year, OR 5 or more episodes in each of the preceding 2 years, OR 3 or more episodes in each of the preceding 3 year
Clinical features (sore throat plus the presence of one or more qualifies as a counting episode)	Temperature > 38.3^{o} C, OR 101^{o} F Cervical lymphadenopathy (tender lymph nodes or >2 cm), OR Tonsillar exudate, OR Positive culture for group A beta-haemolytic streptococcus
Treatment	Antibiotics had been administered in conventional dosage
Documentation	Each episode and its qualifying features had been substantiated by contemporaneous notation in a clinical record, OR If not fully documented, subsequent observance by the clinician of 2 episodes of throat infection with patterns of frequency and clinical features consistent with the initial history

(Source Paradise et al., 2002)

Adenotonsillectomy remains the most common procedure done in ear nose throat setting. (Radha &Tanya. 2007) epidemiologically large international difference exists in adenotonsillectomy rates. 110/ 10000 were recorded in Northern Island, while 19/10000 were recorded in Canada (Van Den Akker et al., 2004). According to AAO-HNS tonsillectomy is defined as a surgical procedure perform with or without adenoidectomy that completely removed the tonsils including it is capsule by dissecting the pretonsillar space between capsule and the tonsillar wall (Reginald et al., 2011).

Historically tonsillectomy was initially described over 3000 years ago (McClelland et al., 2005). The concept of the operation remains the same i.e. to removed tonsils and achieved haemostasis. Even though new development has been recorded in a field of surgical instrumentation. The most widely employed technique in adenotonsillectomy is tonsillectomy via cold steel instrument which was started in the 19th century (Sayin & Cingi, 2012). In this technique patient will be placed under general anesthesia in Rose position i.e. in supine position neck extended by means of shoulder roll and head supported with a head ring. An adequate tonsil exposure will be achieved by means of Boyle-Davis mouth gag (Figure2.3). Adenoid will be inspected and curettage by means of an adenoid curette (figure 2.4). Tonsil will be retracted medially by means of Dennis-Brown forceps (Figure 2.5). Tonsillar capsule will be breached and dissected free from it is bed by means of tonsillar dissector and tonsillar stalk will be crushed out and remove with aid of tonsillar snear (Figur2.6). Haemostasis will be achieved by pressure and ligatures, in this technique the whole tonsil and it is capsule will be removed en bloc it is called an extra capsular method (Tysome & Kanegaokenkar, 2012).

Another surgical technique include; cautery dissection or diathermy method (Figure 2.7). Others are harmonic scalpel method, laser tonsillectomy, radio frequency ablation, tonsillectomy by means of microdebrider (figure 2.8). And coblation technique. In some

of these techniques, tonsillar tissue will be partially removed with an intact capsule (intracapsular), the remaining tonsillar tissue will exert a cushion effect and reduced post-operative complication and quickened recovery but, sometimes the remaining tissue may regrow.

Table 2.2: summary of tonsillectomy techniques

Technique	Risk of bleeding	postoperative pains	Risk of trauma to the surrounding structures	Operation time	Risk of recurrence
Cold instrument	is higher than elecrocautery	less compares to elecrocautery	is less than elecrocautery	longer than elecrocautery	less than radiofrequency ablation
Elecrocautery	less compare to cold technique	higher than cold technique	higher than cold technique	shorter than cold method	lower than coblation
Radio frequency ablation	less compare to cold technique	less compare to elecrocautery	is less compares to elecrocautery	less compares to cold technique	is higher than elecrocautery and cold method
Coblation technique	higher than elecrocautery	less than elecrocautery	less than elecrocautery	lower than cold technique	less than radio frequency ablation
Harmonic scalpel	less compares to other techniques	less pain compares to other techniques	less compares to elecrocautery	less than cold technique	less than radio frequency ablation
Microdebrider	less than cold technique	less than elecrocautery	less than elecrocautery	less than cold technique	higher than radio frequency ablation
Laser- assisted tonsillectomy	less than cold technique	higher than micro derider	higher than elecrocautery	longer than cold technique	lower than radio frequency ablation

Sources from (Senol et al., 2011)

Figure 2.3: David Mouth-gag

Figure 2. 4 Adenoid curette

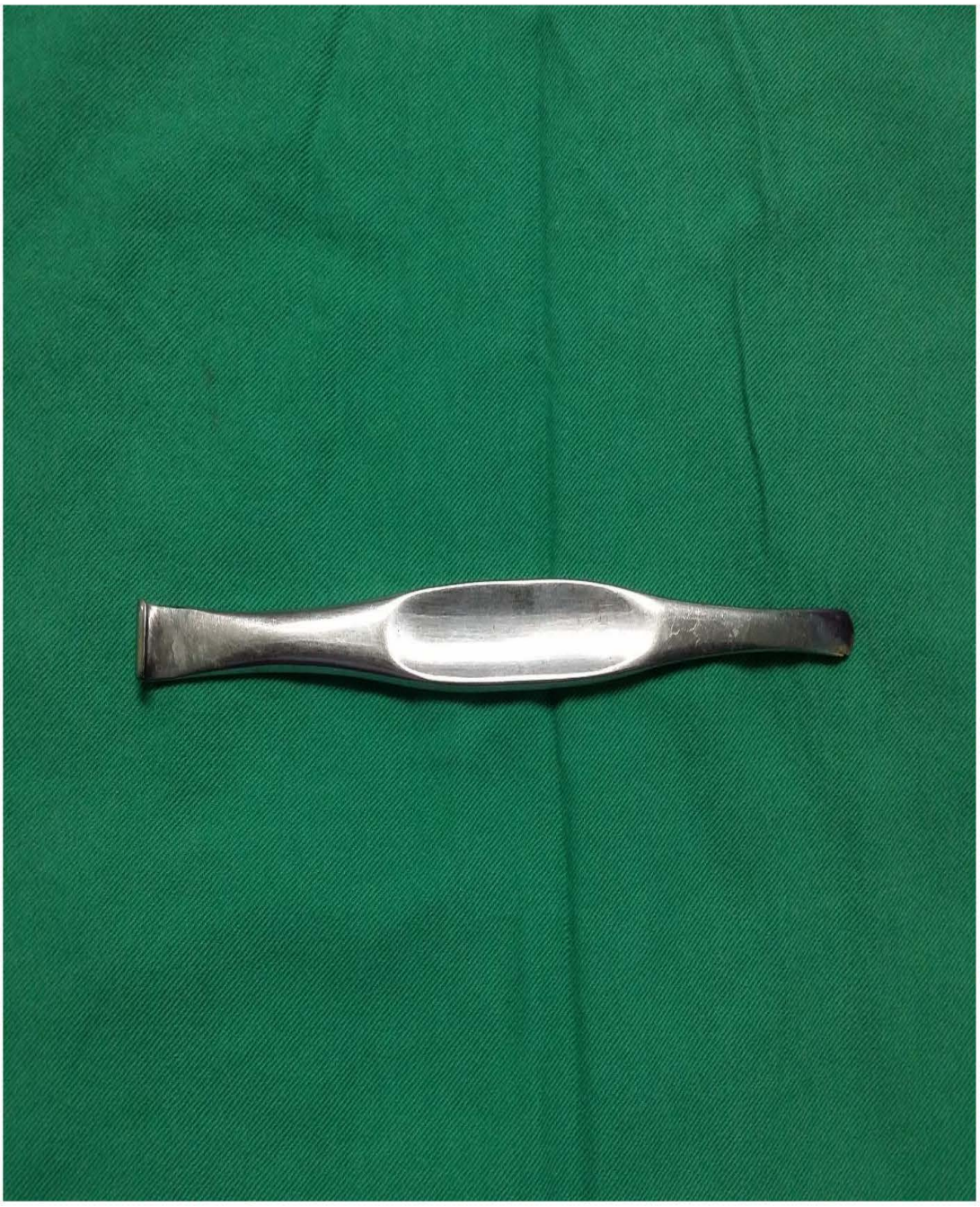

Figure 2.5: Pillar Retractor

Figure 2. 6: Tonsillar snare

Figure 2.7: Bipolar Diathermy

Figure 2.8: Microdebrider

Tonsillectomy is a simple and safe procedure. It involves a short period of patient hospital stays post-operative, usually, will be discharged 24 hours post-operative. Occasionally patients stayed up to 48 hours post operation if there are complications, for example bleeding or oedema of the uvula. In some centres tonsillectomy is being done as a day case in which patients will be discharged on the day of operations. Post-tonsillectomy complication differs between operations technique.

A large patient survey by Gallagher et al 2010 involving 4776 patients who underwent adenotonsillectomy where he compared different operation techniques, he found that microdebrider intracapsular tonsillectomy is associated with lower rates of post-tonsillectomy haemorrhage and dehydration when compared with coblation and elecrocautery techniques. Most common post-tonsillectomy complications from his survey was pain this differed from what Oomen et al (2012) find in his study; where he found haemorrhage was the most common post tonsillectomy complication. Second most common complication in Gallagher survey was bleeding then dehydration and upper airway obstruction contrary to this a randomized systematic review of controlled trials on tonsillectomy with cold instrument versus diathermy, monopolar cautery, and a harmonic scalpel or coblation technique has shown no significant differences in post- operative complications (Burton & Doree, 2007).

2.2.4 Variation in adenotonsillectomy management

Variations exist in post adenotonsillectomy patient care in the area of choosing a right analgesic, use of antibiotics, right time for discharge and when to follow up. (Shay et al., 2015) Sometimes these variations put more financial burden on the patients and his families, it reduces overall satisfaction and causes psychological trauma to patients and his guardians. (Chen. Et al., 2014)

Examples of variations in tonsillectomy care practice was on use of intra operative steroid, Afman et al. (2006) have shown that a single, intraoperative dose of dexamethasone may reduce post-tonsillectomy pain on post-operative day 1, by a factor of 1 on a 10-point analogue pain scale, he further said as the side effects and cost of dexamethasone dose appear negligible consider to the benefit patient will derive, he suggested for it is consideration on routine basis, but despite it is potential benefit it is not routinely practice in most centres including Hospital USM, at Hospital USM most doctors prescribe paracetamol as the first choice analgesic in post adenotonsillectomy while others prescribe diclofenac.

The second post adenotonsillectomy variable management practices are administration of antibiotics, normally after tonsillectomy the tonsillar bed healed by fibrosis, but occasionally operative wound can be contaminated by normal flora inhabiting oropharynx, to prevent infection some clinicians recommended routine antibiotics use as part of the postoperative management, however, some clinicians like Baloch et al., 2012 do not agree with this because to them the evidence raised in support of it is weak. At Hospital USM, most doctors write antibiotics post adenotonsillectomy.

The third area of variation is the right time for the patients to be discharged post-operative some clinician discharged their patient on the same day of operation others required a twenty-four hours hospital observation. (Goyal et al., 2013). This depended on the level of the patient in the MY-DRG scale those in scale 1 are likely to be discharge on day 1 post- operative because the anticipated post-operative complication will likely be low compared with those on higher scale. At Hospital USM doctors discharged patients twenty four hours post-operative except if there is complications.

Fourth post adenotonsillectomy area of variation is on the right time for follow up. To some doctor's post-operative follow up is not necessary except if tonsillectomy is for diagnosis purpose and tissue has been send for histology, but majority of doctors considered it necessary, some review patients one week after operations; some after two weeks. The above care variation is also in existence at Hospital USM. To harmonize the practice and to eliminate variations, Hospital USM management anticipated a benefit may be derived if standard pathway care management flow is introduced in a management of patients who are undergoing of adenotonsillectomy; this study is aimed to evaluate the standardized clinical pathway of adenotonsillectomy in Hospital USM.

CHAPTER THREE

3.0 Rational of the study

Studies from many centres who have implemented CP has shown an improved patient care outcome, improved health care costing process and reduced workload on health care providers (Rotter et al., 2008).

Post adenotonsillectomy patients care in Hospital USM has a lot of variations in the area of the duration of hospital stay, the use of antibiotics, and prescription of the pain relieving medications and the right time of follow- up after discharge (after cross- examination of patient case note from Hospital USM medical record). These variations may affect the overall costing of the operation and put more burden on the family resources. Based on the above mentioned-observations Hospital USM developed an effective way of eliminating the variations in care by developing a clinical pathway of adenotonsillectomy in 2012. The aim of this study is to evaluate the implemented standardized clinical pathway of post adenotonsillectomy patients at Hospital USM.

CHAPTER FOUR

STUDY OBJECTIVES

4.1 General Objective

To evaluate the standard Clinical Pathway in treating adenotonsillectomy patient in Hospital USM.

4.2 Specific Objectives

1. To identify the variances in the adenotonsillectomy clinical care pathway
2. To calculate a cost of adenotonsillectomy based on the developed standard CP and non CP.

3. To assess the cost saving and the effectiveness of standard CP adenotonsillectomy on patient care outcomes.